

Broadest study to date of Bornean elephants yields insight into their habitat selection

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Elephant. Credit: Picture by Yathin S Krishnappa. Licensed under CCBY-SA3.0

According to the World Wildlife Fund, there are only an estimated 1,500 Bornean elephants in the wild, with populations mostly concentrated in Sabah, Malaysian Borneo—a region that has historically experienced

unprecedentedly high rates of deforestation. Due to the conversion of Bornean forests for agriculture, elephants were forced from their natural habitats into human-dominated landscapes, increasing incidences of conflicts between people and elephants, such as ivory poaching and crop raids. These conflicts have resulted in rising elephant deaths, cementing this vulnerable species' Endangered status on the IUCN Red List.

To give elephants the space they need to roam freely without coming into contact with people, conservation scientists seek to create protected wildlife corridors, areas of land that allow elephants to travel between their habitats safely. But to create these paths, scientists must first determine how much space elephants need to roam as well as the kinds of habitats they prefer—and avoid.

In collaboration with scientists from Danau Girang Field Centre, Harvard University, and the South East Asia Rainforest Research Partnership, scientists from the Arizona State University Center for Global Discovery and Conservation Science (GDCS) led the broadest study to date that assesses how elephants utilize different landscapes in Sabah. The research study was published on January 10, 2020, in the journal *Global Ecology and Conservation*.

The research site was located in the Malaysian state of Sabah, an area encompassing the majority of the Bornean elephant's range within forests and tree plantations. Between 2010-2017, the team fitted the elephants with GPS collars. Data from these collars were combined with topological and LiDAR data obtained by GDCS's Global Airborne Observatory (GAO) to track how natural and anthropogenic factors such as forest quality, topology, urbanization, and connectivity between landscapes influenced the elephant's movements and behaviors.

"This study has utilized a vast array of locational and remote sensing data to provide nuanced behavioral insight for elephant populations at severe

risk of decline and even extinction," noted lead author Luke Evans, a postdoctoral researcher of GDCS director, Greg Asner.

The researchers discovered that elephants actively avoided urbanized areas, such as roads and villages, and moved more quickly and directly in areas with less vegetation. "Our study showed overall active avoidance of urbanized areas by elephants despite increasing levels of human-elephant conflict throughout Sabah. This suggests that the increase in Bornean elephant mortality is not adequately explained without significant increases in incidences of active hunting and ivory poaching, as well as incidences of poisoning in agricultural landscapes," said Benoit Goossens from Cardiff University and Danau Girang Field Centre.

The researchers also found that [elephants](#) preferred to travel along ridgelines, suggesting that these pathways should feature in future protected areas such as wildlife corridors.

"Together, the airborne and field-based observations helped us to untangle how this keystone species utilizes landscapes, providing vital insight into best practices for implementing effective large-scale management plans," said author Greg Asner.

More information: Luke J. Evans et al, Natural and anthropogenic drivers of Bornean elephant movement strategies, *Global Ecology and Conservation* (2020). [DOI: 10.1016/j.gecco.2020.e00906](https://doi.org/10.1016/j.gecco.2020.e00906)

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